

New Diagnostic, Launch and Model Control Techniques in the NASA Ames HFFAF Ballistic Range

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Abstract

This report presents new diagnostic, launch and model control techniques used in the NASA Ames HFFAF ballistic range. High speed movies were used to view the sabot separation process and the passage of the model through the model slap paper. Cavities in the rear of the sabot, to catch the muzzle blast of the gun, were used to control sabot finger separation angles and distances. Inserts were installed in the powder chamber to greatly reduce the ullage volume (empty space) in the chamber. This resulted in much more complete and repeatable combustion of the powder and hence, in much more repeatable muzzle velocities. Sheets of paper or cardstock, impacting one half of the model, were used to control the amplitudes of the model pitch oscillations.